

## THE LIFE CYCLE, DISTRIBUTION AND HABITS OF *HYPENA OBSITALIS* (HÜBN.) (LEPIDOPTERA: NOCTUIDAE) IN DEVONSHIRE

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This is an account of further studies into the life cycle, distribution and habits of *Hypena obsitalis* (Hüb. n.) (the Bloxworth snout) since the discovery of a colony by the author on the Torbay coast (Dobson, 1991). The same field work techniques that were used during the 1990 to 1994 investigations were also used in the same area during 1947 to 1959 when the author's home was in Torquay, suggesting very strongly that the species did not then occur in the Torbay area. Alas now living in Hampshire, it has not been possible to carry out a weekly survey throughout the year, but the data provided should illustrate the moth's life cycle and habits in Devonshire.

Following the discovery of the colony on 2 and 3.viii.1990, Dr Barry Henwood obtained a female *obsitalis* on 8.viii at the same location (Henwood, 1991). Of the four larvae received in the post from him, two were fed with *Parietaria judaica* L. and the others with *Urtica dioica* L.; the former two were reared successfully and resulting imagines emerged on 15.ix.1990, but the latter two struggled and died before pupating. As the imagines had been set for exhibiting, the cycle through to the following year could not be studied.

In the Channel Islands the imago has been recorded in every month of the year except February during 1960 and 1963 and on 8.ii.1972 over 200 were counted overwintering in an old German bunker (Emmett & Heath, 1983). It has also been found in garden sheds, garages and other buildings (Skinner, 1984). To find possible overwintering sites, the location was visited on 19.i.1991. Using a beating tray and a stick, an attempt was made to find or dislodge specimens from possible hiding places: low hedges, tangled undergrowth, scrub on upper cliff slopes, rabbit holes and deep crevices in the cliff just above the beach, but without success.

From the August 1991 breeding of ova and larvae sent through the post by Barry Henwood and Bernard Skinner, seven specimens were retained for overwintering. From 12 to 17.ix the imagines were put into a clear plastic box, dimensions 279 × 159 × 102 mm with *Parietaria judaica* L., tissue and a small cotton wool ball soaked in red wine steeped in sugar to give the moths sustenance. The plastic box was placed on the raised carpeted floor of a wooden shed in Basingstoke. However on 21.ix, the maximum day temperature in the shade outside the shed was 23.5 °C and because the imagines were so lively, the container was kept for a week during daylight hours in a cool bedroom and at night in the shed. At dusk on 29.ix five were lively when disturbed, one was crippled and one dead. At dawn on 5.x, when the temperature was 6 °C and the imagines in a state of torpor, the five healthy imagines were transferred to another container with similar contents. It was then discovered that two ova had been laid on a piece of tissue. The imagines then remained in a state of torpor. After a hard frost outside, minimum temperature of -3.5 °C, during the night of 6/7.xii, they were examined next morning and found still alive, though in torpor. With even severer frosts forecast, newspaper was wrapped around the container, which was placed on boxes about a metre off the floor. During the night of 10/11.xii the minimum temperature outside was -8.5 °C, and the next day three imagines were dead and the ova collapsed. A bag of potatoes covered with newspapers in the shed was also frosted. The following night there was another severe frost, minimum temperature -8 °C, during which the remaining two succumbed.

From observations of the imagines in the shed, at 15 °C or higher outside temperature, the moths were very alert and any movement in the shed would result in them flying, particularly at dusk. From 14 °C down to 7 °C they were quiet and would not fly unless the container was tapped and below 7 °C outside temperature, they were in a state of torpor. In the protection of the shed they survived an outside temperature of -3.5 °C, but in their habitat it is feared they would not survive a temperature lower than -5 °C in their overwintering site. It has been found since that the shed temperature is 1 °C warmer on a cold night than the outside temperature. The probable overwintering sites would be in a deep cover of scrub, ivy and vegetation, because of a lack of suitable buildings in most locations. The species can survive the winter in south Devonshire with its milder climate and close proximity to the sea. However, if the south Devonshire coast were to experience a severe winter, the species would die out.

The next step was to find when overwintering imagines would awaken. A careful watch was kept on the weather forecasts and in recording temperature, making an allowance for the south Devonshire coast. The temperature at dusk first reached 16 °C on 14.v.1992. On 24.v with a dusk temperature of 16 °C the location was visited from dusk onwards. No imagines were in flight. *Parietaria* and *Urtica* were swept vigorously to check if there were any larvae. One female was swept out from a thick growth of *Parietaria* deep within the hedge and close to the thick vegetation on the other side. The following night also with optimum weather conditions for most other species with many moths again in flight, not one *obsitalis* was seen, probably due to the temperature being only 13 °C. Then a return to Hampshire had to be made. Bob Heckford (pers. comm.) informed me later that on 12.vi. he saw two worn imagines at two locations. On 20.vi another evening visit was made, but no imagines were seen. The *Parietaria* that had not been cut by the council workmen was searched randomly for ova and then tapped with a stick over a beating tray but no ova or larvae were found. So it appeared that overwintering specimens were reappearing during late May to early June and the ova probably overlooked.

With a long illness in 1993, the author was unable to visit Devonshire, but with improved health in 1994, was determined to find first brood larvae, the second brood larvae having been found on 22.viii.1992 in another location (Pickles, 1993). An estimation had to be made for suitable dates for finding the larvae. Breeding the second brood in captivity took 5 days for the ovum, 16 days for the larva, 16 days for the pupa, resulting in a total of 37 days (Henwood, 1991). Calculating forward from imagines seen on 12.vi, larvae should be found from 17.vi to 3.vii. Calculating back from imagines on 2.viii (Dobson, 1991) and 11.viii (Henwood & Skinner, pers. comm.), larvae should be found from 2 to 17.vii and from 10 to 27.vii respectively. A holiday to south Devonshire was booked for the week 16 to 23.vii. Unbeknown to the author, Roy McCormick made visits to three of the locations and David Wedd made one to the second location during 1994. Their records have been added to the 1994 results.

To protect the species, locality and local feature designations and map references have been omitted. All locations listed are within the Torbay Borough Constituency Boundary and are on or near an imaginary north-north-west to south-south-east line spanning 10.5 km. Height and distance measurements are either based as accurately as possible on Ordnance Survey map data or estimated.

First location: hedgerow with good growth of *Parietaria judaica* L. up to 1.25 m in height amongst *Urtica dioica* L. and other herbage beneath a canopy of shrubs and trees; aspect—east and shaded, 105 m above sea level and 220 m from the sea; known history—female, early viii.1991 (B. P. Henwood, pers. comm.), imagines 1992

(Clarke, 1993), 9.vi.1994 none (R. F. McC.), 17.vii.1994 *Parietaria* and *Urtica* searched and beaten, foliage disturbed, none, though probably in pupal stage, if there (A. H. D.).

Second location: horizontal cleft in cliff, third of way up from beach between scree and scattered herbage below and overhanging rock above with restricted *Parietaria* growth with nearby dense herbage and foliage against cliff, also adjacent footpaths with *Parietaria* growth along sides and with empty and inhabited buildings nearby; aspect—cliff, north-north-east and shaded, paths, various and sunny or shaded, 30 to 10 m above sea level, 15 to 40 m from the sea; known history—22.viii.1992, larvae from which imagines were bred from 16.ix.1992 (Pickles, 1993), 7.vi.1994 none, 17.vii.1994 cliff site, tapping some *Parietaria* onto beating tray produced one larva in third and three in fourth instars, edge of path beneath fencing, one fifth instar larva on *Parietaria* (A. H. D.) (third instar larva died in the next instar, parasitized, the cocoon posted to Dr A. A. Allen, who bred on 5.viii.1994, a female *Metorus colon* (Hal.) (Hymenoptera: Braconidae), a species attacking a wide range of lepidoptera larvae and which does not seem attached to a particular habitat or larval strategy), the fourth and fifth instar larvae produced imagines on 2 and 3.viii.1994, 3.viii.1994 imago and larvae, 13 and 22.viii.1994 larvae (R. F. McC.), 25.viii.1994 larvae in last instar, which produced imagines which laid third brood ova in September, and worn imagines (D. J. W.).

Third location: rocks and sparse herbage near path at base of cliffs; aspect—east and sunny until mid-afternoon, seen 7 m above sea level, 12 m from sea; known history—12.vi.1992, worn imago (R. J. H.), 19.vii.1994 whole area searched above and below cliffs, which are now too dangerous to climb, no *Parietaria* in sight, deep clefts in upper cliffs for overwintering imagines. Nearest *Parietaria* found on wall of car park 400 m away as the crow flies, full grown larvae of *Autographa gamma* (L.) beaten out and a larva in its second instar which looked like *obsitalis*, but proved to be *gamma* in the third instar.

Fourth location: coastal path with mostly low compact hedges with lush growth of *Parietaria* in places, but many plants next to path were cut down by council workmen during the first half of June, 1994; a derelict garden shed found nearby, but most of roof missing so little protection for overwintering imagines; low thick scrub down to cliffs, danger of cliff fall to part of path; aspect—south-west to south-east, sunny except for one continuously shaded patch of *Parietaria*, 20 to 35 m above sea level, five to 50 m from the sea; known history—2 and 3.viii.1990, 12 imagines (Dobson, 1991), 8.viii.1990, female (Henwood, 1991), 29.vii.1991, male (A. H. D.), 11.viii.1991 two females (B. P. Henwood & B. F. Skinner), 6.ix.1991, imago (Heckford, 1992), 24.v.1992, female (A. H. D.), 12.vi.1992, one worn imago, (R. J. H.), 10.vi.1994 none (R. F. McC.) (temperature not high enough for flight), morning 19.vii.1994 using beating tray under *Parietaria* produced larvae of *Vanessa atalanta* (L.) and *Autographa gamma* (L.), but no *obsitalis*. Towards end of beating session a male flew out of a bush. *Parietaria* growing in the shady area was collected to feed larvae back at the cottage, later when checking the foodplant before putting it into larvae containers, three scattered ova under one leaf later produced *gamma* larvae and two singleton ova under other leaves produced *obsitalis* larvae; night 20/21.vii.1994 pre-dusk to 22.00 hours, seven imagines, one female ovipositing on *Parietaria* near where ova had been found, at 00.05 hours, one imago and at 00.45 hours, two imagines in flight (A. H. D.); 3.viii.1994 none, 26.viii.1994 larvae (R. F. McC.).

Fifth location: cliff top site, short grass with *Parietaria* growing at base of walls; aspect—various and sunny, except in shade cast by walls, 52 m above sea level, 120 m from the sea; known history—28.vii.1989, one female at M. V. light (Henwood, 1991) and believed to have been a migrant, the first confirmed county record, 22.vii.1994

a brief visit at 22.30 hours, two females, one ovipositing on *Parietaria*, and a male seen (A. H. D.).

From a few ova, ex female secured on 20.vii.1994, second-brood imagines were bred on 21 and 22.viii.1994. The two kept for overwintering have been going into and out of torpor with the range of temperature experienced. They are still alive today (9.x.1994) but now in torpor with the overnight temperature in the shed having dropped to 2 °C. To facilitate recharging the contents of the plastic box when the temperatures were higher, the box was kept in the refrigerator overnight so that at 5 °C next morning the imagines were in a state of torpor.

Regarding flight habits, the original statements (Dobson, 1991) still remain true, though the moth will fly after midnight. The species usually ignores light; only two of the 1994 imagines flew towards torch light. The species was attracted neither to Barry Henwood's bulb over a sheet nor to Dobson's actinic (Heath) trap, 1.5 and 2 m respectively from the imagines' flight paths.

Abroad, *Urtica dioica* is a recorded foodplant and the Iford, Dorset specimen was seen amongst nettles (Emmett & Heath, 1983). In south Devon, the only foodplant appears to be *Parietaria judaica*; however, the few *Urtica* plants seen could have been worked at the wrong time or overlooked in preference to *Parietaria* with which the author was having success. It is still advisable for others to work both plants. In captivity the species has been reared successfully on *Soleira soleirolii* (Dandy) (Riley, 1992). The ovum and larva in the early instars could be confused with *Autographa gamma* (L.). The ovum of *gamma* in its development turns to a shade of pale green similar to *obsitalis*. Its larva in the first two instars is like *obsitalis* in its stance at rest, colour and markings but it has three pairs of prolegs compared to the four pairs of *obsitalis*. The larva does seem to prefer shady places (Seitz, 1914). The pupa of *obsitalis* has not yet been found in the wild on mainland Britain; in captivity the larva spins a flimsy cocoon amongst leaves of *Parietaria* out of which the pupa can fall, when the leaves are moved.

The life cycle in Torbay will now be compared with statements in literature. It was believed that *obsitalis* was 'single-brooded, flying from August to October and after hibernation in May and June' (Skinner, 1984). From the data, there appears to be a staggered awakening from the overwintering state from late May to mid-June. This could be the result of weather and variation between the aspects and micro-climates of the locations. The earliest first brood cycle commenced with ova laid in early June resulting in imagines about 17.vii as witnessed in locations four and five. The latest first brood cycle with ova laid at the end of June resulted in imagines emerging in early August and with larvae on 17.vii as witnessed in location two. The second brood imagines emerge from late August to mid-September with a flight period until mid-October, earlier or later according to the temperature. All these cycles can be affected by the weather; in 1990, June was the dullest, coolest and wettest for many years resulting in the first brood imagines flying in early August in location four. Could there be a third brood? Dobson and Wedd have experienced ova of a third brood being laid in captivity, but there is no evidence yet of it taking place in nature in the British Isles. In Continental literature there is some confusion over the broods, probably the result of an extended ovipositing period and overlapping broods; in May and June and in August and September. Observed in May and December in Portugal, the larva lives in April and May and in the late summer (Spuler, 1908); south of France, southern Europe, north Africa and Asia Minor, moth from April to September, sometimes later according to terrain, larva in Spring (Culot, 1914-17); localities chiefly in southern France, June, July to October (Lhomme, 1923-35); in Alsace, Valais and southern Alps to 1000 m, mostly common in two to three not clearly separated generations from early June, overwintering to mid-May, the moth comes into houses

to overwinter, larvae from May and in the autumn (Forster & Wohlfahrt, 1971); throughout the whole year, often captured in caves and dark places (Calle, 1983); Greece, flight period March to December, two or three generations, adults of autumn generation overwinter in caves, holes and buildings (Hacker, 1989). The flight periods do vary according to terrain and latitude, hence June to October in France and March to December in Greece. Could Spuler's statement imply that ova overwintered or did he overlook a March flight? The earlier authors appear to have been unaware of overwintering. A number of sites for overwintering on the Continent and the Channel Islands have been mentioned but as yet none has been found in Devon and it is hoped that further work will be carried out by others to resolve this. However the Rye, Sussex specimen of 6.iii.1983 being disturbed in a garage, flew and resettled on a beam (Tweedie, 1983) (the previous September being good for migrant moths, followed by a very mild winter, strongly suggest that the specimen overwintered).

It has been suggested that *obsitalis* occurred in south Devon, in the late 19th century, but the only statement that has been found is the late Captain Stidston's: 'In my own collection there are eight specimens rather old and worn. I recognise my setting of early collecting days and therefore may have been taken in the South Hams district but, of course, the record cannot stand' (Stidston, 1952). The species is now established in Torbay and further to the south Roy McCormick (pers. comm.) has found larvae on 16.viii.1994 in a location by the mouth of the River Dart. David Wedd (pers. comm.) has found larvae common on *Parietaria* in an open site on the north Cornwall coast, but it is very doubtful if this colony was established by the 1943 migrant specimen at Boscastle, for the extremely low temperatures of the 1947 severe winter would have wiped out any colonies in the south-west. If such weather does not recur, the future prospects for this species on mainland Britain are good. Parasitism is low at present and the colonies, being on or close to cliffs, should be safe from development. It should be found in more localities, where its foodplant occurs, from Land's End to the Isle of Purbeck.

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## ANNOUNCEMENT

**Microlepidoptera of Middlesex: an appeal for records.**—Following on from the success of the recent publication of *Larger moths of the London area* the London Natural History Society now proposes to work towards publication of a checklist of the microlepidoptera of Middlesex. It is expected that this exercise may take about 5 years to complete.

The term Middlesex involves the entire vice-county 21 and thus includes all the London boroughs north of the River Thames with the exception of the five lying east of the River Lea; these five are in South Essex. Middlesex also incorporates some areas which lie in the current administrative county of Hertfordshire, notably the Potters Bar area. Records are actively sought from appropriate persons for all those families generally regarded as “micros”—thus including the Psychidae which were formerly referred to as “macros”, as well as those which are sometimes referred to as “mesolepidoptera” (Tortricidae, Alucitidae, Pyralidae and Pterophoridae).

Records should include the species name, the Bradley and Fletcher code number (to avoid nomenclatural confusion) the date where possible and the locality. Records will be assumed to relate to imagines unless “mine”, “larva” or other qualifying statements are given alongside. Localities will ideally involve a place name and a four figure grid reference. Place names should be those appearing on the Ordnance Survey maps; precise localities, such as the names of nature areas or ecology parks in London are desirable, but if these do not appear on OS maps the nearest locality should always be given. Where a grid reference can not be obtained, a precise address as it appears in one of the various published books of street maps of London should be used. Site lists will ideally be presented in log book order to facilitate data entry. Overnight trap dates should be given according to the example 23/24 August or 23 August, and not as 24 August. Approximate counts and sexes are desirable for immigrants. Confidentiality of selected records may be requested. Records are required from all time, not just the present period.

Records should be addressed to C. W. Plant, 14 West Road, Bishop's Stortford, Hertfordshire CM23 3QP, who will happily provide more detailed information. All communications will be acknowledged and records from outside Middlesex contained in mixed lists will always be forwarded to appropriate recorders unless directions are given to the contrary.